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ABSTRACT

Up to two-thirds of African languages have a system of noun classification of some sort. This paper proposes an alternative approach to the noun class system of the Dagaare and Akan languages based more on an interaction between morphology and phonology than on semantics. Dagaare and Akan are two West African languages that exhibit mainly suffixal and prefixal nominal inflection, respectively. The basic claim is that by relying on number affixes, Dagaare and Akan nouns can be put into broad classes. This broad classification can be fine-tuned and categorized into sub-classes based on phonological processes such as vowel harmony, assimilation, segmental deletion, vowel lengthening, consonant mutation, and gemination. While semantic and other non-morphophonological factors may be attested in noun class systems, it is argued that these systems are best seen as products of an interplay between phonological and morphological processes. Morphophonological rules and regularities are more universal and consistent than semantic regularities within the noun class systems of Dagaare and Akan. (Contains 13 references.) (SM)

The Morphophonology of Noun Classes in Dagaare and Akan

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Abstract

Earlier research (e.g. Heine 1981) indicates that the majority of African languages – up to two-thirds of these languages - exhibit noun class systems. A language may be said to have a noun class system if the nouns of the language can be categorized according to a system of concord or affixal markings on the nouns. Noun classification has been a topic of much discussion among scholars of African linguistics (e.g. Heine 1981; Ourso 1989; Bodomo 1994; Delplanque 1995; Breedveld 1995; Ikoro 1996; Creissels 2000, Dimmendaal 2000) as well as among scholars of Australian languages (Leeding 1989; Harvey & Reid et al. 1997). A major issue is how to evolve a coherent set of criteria for establishing a convincingly consistent noun class system within individual languages and language groups. A leading approach is to classify nouns based on semantic criteria (e.g. Mohamadou 1994; Delplanque 1995). This paper proposes an alternative approach to the noun class system of Dagaare (Gur, Niger Congo) and Akan (Kwa, Niger Congo) based more on an interaction between morphology and phonology than on semantics (Bodomo 1994 & 1997). Dagaare and Akan are two West African languages that exhibit mainly suffixal and prefixal nominal inflection respectively. The basic claim is that by relying on number affixes, Dagaare and Akan nouns can be put into broad classes. This broad classification can be fine-tuned and categorized into sub-classes based on phonological processes such as vowel harmony, assimilation, segmental deletion, vowel lengthening, consonant mutation, and gemination. While semantic and other non-morphophonological factors may be attested in noun class systems it is argued that these systems are best seen as products of an interplay between phonological and morphological processes. Morphophonological rules and regularities are more universal and consistent than semantic regularities within the noun class systems of Dagaare and Akan.

1. Introduction

Two out of every three African languages have a system of noun classification of some sort (Heine et al. 1981). Noun classification is a prevalent topic of discussion among scholars of African Linguistics (e.g. Ourso 1989; Creissels 2000; Dimmendaal 2000 etc.). These studies

attempt to evolve an appropriate system of noun categorization suitable for a particular language or groups of languages.

In this paper, we argue for a morphophonological account of the noun class systems of Dagaare and Akan. Our proposal, a follow up of Bodomo (1994 & 1997), stems from the build up of the various noun forms and the subsequent phonological processes that emerge in the composition. This is in contrast to a solely semantic-dependent criterion; a position adopted in works like Mohamadou (1994) and Delplanque (1995). The formal aspects of our analysis are within the general generative phonology but some aspects are particularly related to lexical phonology.

2. The Classification System

An overview of Dagaare and Akan nominal morphology shows that the most appropriate criterion to set up noun classes is number – i.e. singular and plural – categorization, which is marked in Dagaare mainly by suffixes and in Akan by prefixes. Concord marking, used in languages like Gurenne is an insufficient criterion as it is rather too degenerate in Dagaare. With Akan, Osam (1993) identifies several criteria of noun classification but finally claims that synchronically a class system is lost in Akan.

Based on number affixation, there are, at least, two ways by which Dagaare and Akan nouns can be classed. One is to group nouns based on the similarity, first, of their singular affixes and then their plural affixes. This means that nouns with similar singular affixes and are therefore in the same group may not necessarily occur together in a common plural form. In the establishment of nine noun classes for Dagaare, Angkaaraba (1980) used this criterion. And in what seems to be for only Fante, one of the dialects of Akan, Osam (1993) also opted for this on morphological evidence and came up with six classes. The other is to put nouns

into classes based on the similarity of both the singular and plural affixes. With this criterion nouns are always in the same class whether in the singular or plural.

One advantage with the 'singular-then-plural' approach is its straightforwardness. However, it undermines some important phonological (and semantic) generalizations that are better defined when nouns with the same natural phonological facts are put together in the same class. Some of these facts – e.g. that all nouns with nasal singular affixes also have nasal plural affixes in Dagaare – will be shown. Any other criterion will hide this generalization in the morphophonemics of the languages.

3. The Present Proposals

Our approach to Dagaare and Akan noun classification is based on the second alternative, where particular noun forms are always found in the same class in both the singular and the plural. With this option, we also rely on phonological facts to refine our classification. One therefore needs to pay attention to these processes in order to comprehend the ten noun classes we now propose for Dagaare (Table 1) and the nine for Akan (Table 2).

(1) Noun class system in Dagaare

Classes	Singular Suffix	Plural Suffix
Class 1:	-V	-bV
Class 2:	-V	-rI
a:	-E	-rI
b:	-O	-rI
c:	-I	-rI
Class 3:	-I	-V
a:	-I	-E
b:	-I	-O
c:	-I	-a
Class 4:	-rU	-rI
Class 5:	-Ø	-rI
Class 6:	-rI	-V
a:	-rI	-E
b:	-rI	-O
c:	-rI	-a
Class 7:	-Nv	-Nv
a:	-nI	-ma
b:	-nI	-mε
c:	-mũ	-ma
d:	-ŋE	-nI
e:	-ŋO	-nI
f:	-Ø	-nẽẽ
Class 8:	-aa	-I
Class 9:	-U	No plural
Class 10:	No singular	-Uŋ

(2) Noun class system in Akan

Classes	Singular Prefix	Plural Prefix
Class 1	V-	N-
a:	O-	N-
b:	A-	N-
c:	(V)-	N-
Class 2:	Ø-	N-
Class 3	V-	A-
a:	O-	A-
b:	(V)-	A-
Class 4:	Ø-	A-
Class 5	(+kinship)	
a:	V-	A-_-num
b:	Ø-	Ø-_-num
Class 6	<u>Identity/occupational</u>	
a:	(O)-_-ni	A-_-fuɔ
b:	Ø-_-ni	A-_-fuɔ
Class 7	<u>Identity/occupational</u>	
a:	(O)-_-ni	N-_-fuɔ
b:	(O)-_-Ø	N-_-fuɔ
Class 8:	-A	No plural
Class 9:	No singular	N- (V-)

Note that the basic assumption here is mainly morphophonological. Thus, we first establish the stem of the noun by comparing the singular and the plural forms to identify the affixes.

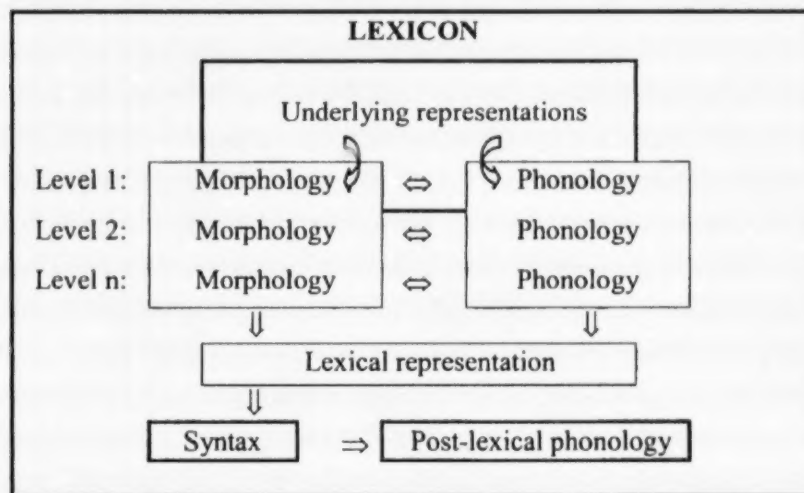
Due to the preference involved in the selection of a particular affix, we realize that only the morphological facts cannot satisfactorily explain our criterion. Accordingly, we also appeal to phonological information. The most prominent of them is vowel harmony through the advance tongue root (ATR) feature specification, marked as [±ATR]. With this harmonic

principle, all stem vowels are required to assume a common ATR specification.¹ The ATR specification in the stems then dictates that of the vowels in their affixes. Other rules such as vowel lengthening and nasal assimilation will be explicated in the course of our discussions.

4. Formalization of the analysis

Formalizing the analysis described above, our sketch in (3) is done in the theoretical machinery of Lexical Phonology (LP)² as a phonological model that adequately addresses our morphophonemic concerns. LP proposes that in word formation, the morphological component supplies the various affixed and compounded forms of the language, upon which the required lexical rules of the language apply to produce the phonetic forms.

(3)



¹ By the vowel harmony principle, the assumption is that the nine and ten vowels in Dagaare and Akan respectively fall into two phonetically distinctive classes. That is a vowel is either produced with an advanced tongue root (+ATR) – these are /i, e, o, u, (a)/ – or with a retracted tongue root (-ATR) – i.e. /ɪ, ɛ, ɔ, ʊ, a/.

²LP as developed in Kiparsky (1985), Mohanan (1986) etc. involves both phonological and morphological theories. That is, it recognizes the fact that phonological representation is very much word-bound, and so word formation consists of phonological rules applying on underlying morphological units supplied by the lexicon. Among these phonological rules, those that apply within word boundaries are defined as lexical, while the inter-boundaries sensitive ones are referred to as post-lexical rules. This model of grammar then is one that provides an interface between phonology, morphology and syntax. Within this general theory various issues and morphophonological methodologies such as underspecification, cyclicity, levels of representation and structure preservation are prominent but we shall not take them up in this paper.

LP suggests that any natural language lexicon has in stock an inventory of stems and affixes as well as word forms whose meaning are not predictable from their constituent parts. Word formation rules, which describe the potential words of the language in question, are then defined. In fact, LP is a re-examination of the interface between phonology, morphology and syntax. The rules in (4) are some of the word formation rules for Akan and Dagaare nouns.

(4) *Some word formation rules (WFRs)*

	Form	Akan	Dagaare
i.	N →	PX-Stem : o-dwai 'sheep'	Stem-SFX : bi-e 'child'
ii.	N →	PX-V : a-dɔ 'farming'	V-SFX : zoo-u 'act of running'
iii.	N →	N-Stem : dade-seɪ 'metal bowl'	Stem-N : bi-dɔɔ 'a baby boy'

The processes in (4) underlie our ability to construct new words. For instance, if our lexicon contains the stem *-dwai* /bɪ- and a suffix *o* /-ɛ , *WFRi* predicts *odwai* /bie as a possible word of Akan/Dagaare.

As noted earlier, the stems and affixes are underlying forms, which are, at best, underspecified for certain phonological features such as ATR, nasality and length. As can be seen from our model sketch of LP in (3), the connection, Morphology $\Leftrightarrow$ Phonology, symbolizes this necessary interaction in order to realize the true lexical representation. In the phonological component, let us assume the vowel harmony rule (*VHR*) schematized in (5) for Akan and Dagaare, and additional vowel lengthening rule (*VLR*) for Dagaare.

- (5) i. VHR: $V_{\text{SFX}} \rightarrow \frac{[\pm\text{ATR}]}{[\pm\text{ATR}]} V_{\text{STEM}}$ _____ (Dagaare)
- ii. VHR: $V_{\text{PX}} \rightarrow \frac{[\pm\text{ATR}]}{[\pm\text{ATR}]} \text{_____} V_{\text{STEM}}$ (Akan)
- iii. VLR: $V \rightarrow VV / C \text{_____} + (\text{b})U$ (Dagaare)

The *VHR* ensures affixal vowel resemblance to the stem vowels ATR specification and *VLR* simply lengthens any noun stem vowel (which is most likely to be composed of a heavy syllable), immediately before the suffix, *(b)U*. The following in (6) give us the idea of how these processes take place in Dagaare and Akan at level 1 of our LP model.³

(6)		Dagaare	Akan
	Underlying representation	: [[zo-] _{st} [-U] _{sfx}]	[[-kuɔ] _{st} [E-] _{pfX}]
Step 1:	Morphological rule (<i>WFRi</i>) applies	: zo-U	E-kuɔ
Step 2:	Phonological rule (<i>VHR</i>) applies	: zo-u	ɛ-kuɔ
Step 3:	Phonological rule (<i>VLR</i>) applies	: zoo-u	--

Shown in (6), the morphological rule combines the right stem and affix to give us zo-U and E-kuɔ. These forms are still unspecified for a common ATR specification, such that we need a phonological rule to convert the forms to the right lexical representation, zo-u 'act of farming' and ɛ-kuɔ 'a rhino'. *VLR* further applies in Dagaare to realize the correct surface realization of zoo-u. These are just a few in the word (and especially nominal class) formation processes within LP. There are obviously many other processes involved that we will exemplify.

5. Illustration of the formalization with the Noun Classes

Returning to our proposed noun class tables in (1) and (2), we have noted that there are two generalizations that cut across all the classes in Dagaare and Akan: *WFRs* (morphological) and *VHR* (phonological). That is, every noun in Dagaare and Akan is a product of stem-affix

³ Within this model the lexicon is divided into various levels or strata or layers. The various phonological rules then apply in turns within each level on the morphological units before they are passed on to another level for further phonological rule application. We believe here that most of the noun class processes described here are at level one.

combination and all the vowels must be either +ATR or -ATR.⁴ Having addressed the persistence of *WFRs* and *VHR*, we now proceed to briefly illustrate the other rules occurring in each of the various classes in both languages, beginning with Dagaare.

5.1 Local rules in Dagaare Noun Class System

Class 1: -V/-bV: This class is the central Dagaare version of the *-bV* class in many Mabia languages. Its exclusive [+human] classification makes it unique. Shown in (7), we, in this and other classes simply state the more local processes that underlie the various word forms.

(7)⁵ Further phonological processes in Dagaare Class 1

Stem	WFRi	SegS.	VSR	TVA	N-dln.	VR	VLR
pɔg-	: pɔg-ɔ	→ pɔɔ					
dɔɔ-	: dɔɔ-ba		→ dɔba	→ dɔbɔ			
nɔŋ-	: nɔŋ-ba				→ nɪba	→ nuba	
kuɔr-	: kuɔr-a						→ kuɔraa

Class 2: -V/-rI: A quite frequent rule of this class is *VLR*, similar to the one formulated in (5iii). This rule, formulated in (8a), states that the stem-final high vowel is lengthened before *-rI*, as exemplified in (8b).

- (8) a. *VLR*: V → VV / C__ -rI
[+High]
- b. bi- + -rI → biiri 'children'
ku- + -rI → kuuri 'rats'

⁴ There are a few exceptional cases and mostly in compounds, where both specifications occur in a word. Also in Akan, when the low vowels /a/ and /a/ occur within a word, they show opacity to ATR such that vowels before the low vowel assume the specification of the low vowel while those after it adopt the opposite, but this is a systematic case, which can be integrated into the dual system (i.e. ±ATR) under the name, double-span harmony. See Clements (1985), and Dolphyne (1988) for details and examples.

⁵ See appendix I for the full names of the various rule abbreviations here (and in others to come) in the word formations. The affected segments are emboldened and italicized.

Class 3: -I/-V: All we need in this class are *WFRi* and *VHR*. The *VHR* underlies the three subdivisions we have here, based on the vowel in the plural suffix (i.e. *E*, *O* or /a/). Indeed, in a few other cases, further phonological explanations such as final *VR* as in (kpoli → kpolu) and *VLR* as in (kpolu → kpoluu 'termites') are invoked.

Class 4: -rU/-rI: This constitutes a small class. The following phonological processes in (9), some of which we also see in the other classes, take place.

(9)

Stem	<i>WFRi</i>	<i>RVA</i>	<i>C-dln</i>	<i>C-eln</i>	<i>VLR</i>	
wa-	: wa-ri	→ wiri			→ wiiri	'snakes'
kpar-	: kpar-ru		→ kparu		→ kparuu	'shirt'
wa-	: wa-ru			→ wau	→ waaü	'snake'

Class 5: -Ø/-rI: In this class, the singular forms of the nouns are exactly the same as the stem forms, for there seems to be no additions. However, with *WFRs*, we claim that these singular forms are more than stems by positing the concept of zero-affix. With this assumption, applying our general rules accounts for all with a few to be modified with *VLR*.

Class 6: -rI/-V: This is another regular class, with regards to our *WFRi*, where stems combine with *-rI* in the singular forms and with either *E*, *O* or /a/ to form plurals. However, vowel shortening (*VSR*) and diphthongization (*Diph*) shown in (10a) and (10b) respectively are often employed to account for some of the data.

(10)

	Stem	<i>WFRi</i>	<i>VSR</i>	<i>Diph</i>	
a.	too-	: too-bo	→ tobo		'cars'
b.	nyo-	: nyo-ri		→ nyuorü	'nose'

Class 7: *The NC*: Dubbed the nasal class because of its all nasal-final or nasalized stems and affixes, this is by far the largest class, subdivided into six subgroups. This nasal property can only be captured by our morphophonological criterion as we noted earlier. We sum up some of the fine-tuning local phonological processes observed here in (11).

(11)	<u>Stem</u>	<u>WFRi</u>	<u>NA</u>	<u>NS</u>	<u>TVA</u>	<u>NC</u>	<u>VLR</u>
	liɛn-	: liɛn-ma	→ liɛmma	→ liɛma	→ liɛmɛ		
	kpin-	: kpin-ɲɛ	→ kpinɲɛ	→ kpɪnɛ		→ kpɪmɛ	→ kpɪmɛ

Class 8: *-aa/-I*: This class is also regular, but also has an additional generalization of consonant gemination in the plural forms. In (12), we illustrate the consonant gemination that partly distinguishes this class.

- (12) pir- → piri (*WFRi*) → pirri (*ConsG*)⁶ 'buttons'

Class 9: *-U/-*: The nouns in this class are derived from verbs to form various types of concepts. As a result they are not realized in their plural forms, just as will be seen in Akan class 8 nouns. In the derivation, some of the phonological rules observed are as outlined in (13), some of which are realized before *WFRi*.

- (13) gaŋ 'to sleep' (parent verb)
 → gɔŋ- (*VR & +R* (stem form)) → gɔŋ-ɔ (*WFRi*) → gɔɔ (*N-eln.*) → gɔɔɔ (*Diph*)

Class 10: *-/-UN*: The nouns here are also derived from verbs and other word classes. They seem to involve more concrete or mass nouns and are therefore conceptually more on the

⁶ Notice that we could alternatively posit that the plural affix is -rɪ or -lɪ and then consonant gemination would be redundant. This could serve as an example of alternative choices between phonological or morphological explanations.

(14) kəql 'to protect, support, cover' → kəəl (SW) → kəəllun (WFRi) → kəəlnun (CS).

Class 1: V-/N-: This class constitutes the most regular and common, such that a learner would easily over-generalize the local phonological processes here to the other classes. The rules are ‘regressive place of articulation assimilation (RP-A)’, which requires a nasal prefix to adopt the place of articulation of the stem-initial consonant and ‘voiced-to-nasal assimilation (Vd-NA)’, which also requires a voice stem-initial consonant to become nasal after a nasal prefix. These are formulated in (15a & b) and exemplified in (15c).

- (15) a. RP-A: N- → N- / ____ C
[α Place] [α Place]
- b. Vd-NA: C → N / N- ____
[+Vd]

Stem	<i>WFRi</i>	<i>RP-A</i>	<i>V-NA</i>	
-duane	: Nduane	→ nduane	→ nnuane	'foods'
-fidie	: Nfidie	→ ɱfidie		'traps'

11

Class 3: V-/A-: This dual subdivisional class, based on obligatory or optional singular prefix marking in the singular, is also very regular. That is, our *WFRi* and *VHR* (in the prefixes) are consistently realized.

Class 4: Ø-/A-: This class is just like those in class 3, except that the singular forms here do not inflect for a prefix. We however, as noted in class 2, posit a zero-prefix value in the singular to enable the *WFRi* to apply. *VHR* is also consistent in the plural.

Class 5: V-/A- _-num: This class of kinship nouns has a 'double-edge' affix in the plural. With these forms, much as *VHR* apply between the prefix and the stem, it fails to hold between the stem and the suffix. The suffixes (i.e. -num & -fuo of class 6 and 7) assume the default value of [-ATR].

Class 6: -ni/A- _-fuo: This class refers to 'identity' or 'occupational' nouns. As noted earlier, our basic rules systematically apply but *VHR* fails between the stems and the suffixes: -ni (singular) and -fuo (plural). This class is different from the class 7 noun forms only in the plural, where a homorganic nasal is assumed in the prefix instead /A/ in this class.

Class 7: -ni/N- _-fuo: As noted in class 6, but for the homorganic nasal prefixes assumed in the plural forms here, they would have been classed together. In the ensuing homorganization by *RP-A*, the stem-initial consonant, if voiced, also becomes nasal by *Vd-NA* as in (16a). Otherwise, this consonant is maintained, as shown in (16b).

(16)	Stem	<i>WFRi</i>	<i>RP-A</i>	<i>VdN-A</i>	
a.	dedua-	: <i>N</i> -dedua-fuɔ	→ n-dedua-fuɔ	→ n-nedua-fuɔ	'prisoners'
b.	panyin-	: <i>N</i> -panyin-fuɔ	→ m-panyim-fuɔ		'elders'

Class 8: *A-/*: This 'single-sided' class of Akan noun forms has no singular-plural distinction, but is conceptually viewed as in singular form. We note that most of the nouns here are of verbal origin. Example, adɔ 'farming' and asa 'dancing' come from the verbs dɔ 'to weed/farm' and sa 'to dance' respectively. Our *WFRi* and *VHR* are however consistent.

Class 9: *-N-* (or *V-*): This is the other 'single-sided' noun class of Akan. Unlike those in class 8, these are without any verbal origin. They normally involve mass nouns; as such we assume plurality for them. Except a few of them with vowel prefixes (with which *VHR* applies), they inflect for the nasal prefixes, with which, as shown in (16), the rule to homorganic nasal realization: *RP-A* is triggered.

(16)	Stem	<i>WFRi</i>	<i>RP-A</i>	
	-frama	: <i>N</i> -frama	→ ɱ-frama	'air'
	-soroma	: <i>N</i> -soroma	→ n-soroma	'stars'

6. Conclusion

The noun class systems of Dagaare and Akan we have presented in this paper, like that of most other African languages, provide a domain for the interplay of various phonological, morphological, syntactic, semantic and conceptual facts. We have argued for and defended the position that a more principled and rigorous methodology in setting up and understanding these systems is to carefully consider their morphophonemic make-up.

We have shown that each noun in Dagaare and Akan is composed of a stem and affixes of different types. This forms the morphological basis for a broad classification of nouns into classes, which can further be subdivided, depending on the phonological processes at play. We have noted *WFRs* and *VHR* to be persistent and universal among the classes in the systems. Others such as *VLR*, *RP-A*, *CG* etc. are more localized but interact with the universal rules to account for word formation in Dagaare and Akan.

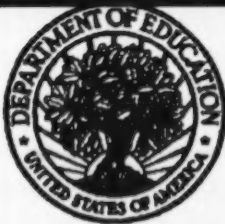
Also evident were semantic and other conceptual factors in the systems, which we do not dispute, but they do not in any way disprove our working hypothesis of the interplay between morphological and phonological processes. This is because of some universals observed across the classes that enable us to attain a better and more consistent analysis of the noun class systems of Dagaare and Akan. We therefore hope that we have not only proposed comprehensive noun class systems for Dagaare and Akan but that we have also been able to successfully argue for the primary roles phonology and morphology play in the noun class systems of Dagaare and Akan and, hopefully, that of other languages.

Appendix I

		Rules	
C-dln.	Consonant Deletion	RVA	Regressive Vowel Assimilation
C-eln.	Consonant Elision	SegS.	Segment Softening
CS	Consonant Shortening	SW	Syllable Weakening
Diph	Diphthongization	TVA	Total Vowel Assimilation
NA	Nasal Assimilation	Vd-NA	Voiced-to-nasal Assimilation
NC	Nasal Change	VHR	Vowel Harmony Rule
N-dln.	Nasal Deletion	VLR	Vowel Lengthening Rule
N-eln.	Nasal Elision	VR	Vowel Raising
NS	Nasal Shortening	VSR	Vowel Shortening Rule
+/-R	Vowel Rounding	WFR	Word Formation Rule (i, ii, iii)
		RP-A	Regressive Assimilation of place of articulation

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